DELTA SCIENCE PROGRAM
INDEPENDENT SCIENCE REVIEW
Adaptive Management Planning - Delta Fall Outflow

SCOPE AND CHARGE TO REVIEWERS

BACKGROUND

The US Fish and Wildlife Service (Service) issued a Biological Opinion (BiOp) on Central Valley Project (CVP)/State Water Project (SWP) operations in 2008 that concluded that aspects of those operations jeopardize the continued existence of delta smelt and adversely modify delta smelt critical habitat. Among other requirements, the Reasonable and Prudent Alternative (RPA) that was issued with the BiOp calls for the use of adaptive management concerning fall Delta outflow (hereafter "Fall outflow") in certain water-year types. The Service determined that the Fall outflow element of the RPA is required to alleviate both jeopardy to delta smelt and adverse modification of delta smelt critical habitat. The Fall outflow action is expected to improve habitat suitability and contribute to higher average delta smelt abundances.

The RPA prescription is expressed in terms of X2, the nominal location of the 2 ppt isohaline (Jassby et al. 1995). The RPA calls for Delta outflow to be managed such that fall X2 must average either 74 km or 81 km upstream from the Golden Gate during the month of September and October, respectively, if the water year containing the preceding spring was classified as wet or above normal. There is an additional storage-related requirement to enhance outflow in November that does not have a specific X2 target. The RPA states that the performance of the action shall be investigated with a research and monitoring program containing a feedback loop allowing the action to be adjusted from learned information (i.e., adaptive management).

At the time the BiOp was issued, the Bureau of Reclamation (Reclamation) responded with a "provisional acceptance" letter. In 2009-10, Reclamation and the Service developed and initiated a package of studies designed to increase understanding about Fall X2 and support future management decisions regarding the fall action.

Reclamation is currently preparing a new plan to adaptively manage fall outflow. Reclamation hopes to formulate a scientifically supported plan that satisfies its needs and avoids jeopardy and adverse modification of delta smelt critical habitat. Reclamation also wants a plan that can be carried out in a framework that allows for adjustment of the action on the basis of lessons learned.

SCIENCE PANEL

To ensure that the initial plan is sound, Reclamation desires independent expert review. A Scientist Panel (Panel) will be convened to review Reclamation's adaptive management plan to ensure it is of sufficient robustness and scientific quality to serve intended purposes. Reclamation also requests that the panel review the basic rationale provided for the action.

Based on discussions of the nature of this adaptive management challenge, Reclamation envisions that a panel will be asked to reconvene annually to evaluate findings and progress

as implementation of the fall outflow action moves forward. Reclamation expects that an effective monitoring and evaluation program will provide important new information that can be used to improve the effectiveness of the action, the efficiency of the action, or to change the nature of the action (if findings support such change).

To help achieve this, a panel will be asked to conduct an annual review of progress and findings on a schedule to be determined later. The panel will be instructed to provide to Reclamation and the Service an annual report detailing each panel member's findings, advice, and answers to agency questions. This report, along with other available information, will be used to inform management decisions pertaining to the application of adaptive management for the fall outflow.

PLAN GOALS AND ADAPTIVE MANAGEMENT

The goals of the plan are (1) to manage Fall outflow for conservation benefits to delta smelt while minimizing water supply and water supply reliability impacts; (2) to increase understanding about the effectiveness of Fall outflow for smelt conservation in order to adjust the action for better conservation effect or water efficiency.

AVAILABLE INFORMATION

The Panel will use available information for its review of the initial plan, including the following listed materials (at a minimum) as the basis for its review:

- Adaptive Management of Fall Outflow for Delta Smelt Protection and Water Supply Reliability (the Reclamation plan)
- Final 2010 POD Report http://www.water.ca.gov/iep/docs/FinalPOD2010Workplan12610.pdf
- Coordinated Operations Biological Opinion (USFWS 2008) RPA Component 3 and associated explanatory material in the RPA and BiOp. http://www.fws.gov/sacramento/es/documents/SWP-CVP_OPs_BO_12-15_final_OCR.pdf
- Independent Review of Two Sets of Proposed Actions for the Operations Criteria and Plan's Biological Opinion (PBS&J, 2008) http://www.fws.gov/sacramento/es/documents/Peer%20review%20of%20proposed%20actions%2011-19-08.pdf
- NRC March 2010 Panel Report http://www.nap.edu/catalog.php?record_id=12881
- DOI Technical Guide (http://www.doi.gov/initiatives/AdaptiveManagement/)

TIMELINE

Approximately June 6, 2011

Panel starts review of plan to determine the strength of the basic rationale for the action and quality, rigor, and suitability of the proposed approach to use adaptive management. Plan is also submitted to the Service for ESA review on this date.

June 13th (afternoon)-June 14th (all day)

The Panel convenes in Sacramento to discuss the Plan and to make initial recommendations.

June 20th-30th, 2011

The panel convenes 1-2 times via teleconference to revise and refine final recommendations.

July 1, 2011

The Panel provides evaluation of plan and written recommendations for improvement to Reclamation and the Service by this date.

Early July 2011

Reclamation revises and prepares draft final plan, informed by Panel and Service reviews.
Service concurrence with revised plan.

Mid July 2011

Possible panel participation in teleconference with Reclamation and Service to discuss responses to the review and features of the final plan. Implementation decision made.

September 2011 through future years

A Panel will continue to provide an annual scientific review and recommendations for interpreting findings and implementing and adjusting fall outflow action. Schedule to be determined.

REVIEW PANEL CHARGE

The Review Panel will be charged with assessing the Plan for Adaptive Management of Delta Fall Outflow from several points of view, with emphasis on the use of the Plan as an adaptive management tool. Specific attention will be applied to the following criteria:

Purpose

- Is the plan responsive to recommendations in the 2008 US Fish and Wildlife Service Biological Opinion on the Central Valley Project and the State Water Project?
- Are the goals of the plan consistent with the goals of the Reasonable and Prudent Alternative?
- How well will the plan, as designed, meet its two major goals: (1) to manage Fall outflow for conservation benefits to delta smelt while minimizing water supply and water supply reliability impacts; (2) to increase understanding about the effectiveness of Fall outflow for smelt conservation in order to adjust the action for better effect and/or water efficiency?
- Is the plan clearly defined and described?
- Is the plan internally consistent and scientifically valid?
- Is it clear for what purpose and how the plan might be used?
- Will implementation of the plan adequately provide the information necessary for refining the goals and objectives, knowledge base and models, and approach of the plan over time?

Approach

- Are linkages between elements of the plan clear?
- Is the use of hypotheses, conceptual models and quantitative models clear and helpful? If not, how might this be changed or refined?
- Will the monitoring and evaluation program result in adequate detection of signal to noise (inherent variability)?
- Is the decision matrix for adaptive management clear and useful?
- Does the plan contain adequate provision for synthesis, evaluation, and reporting?
- What, if any, future role/need is there for additional scientific input and review?

Feasibility

- Is the approach described in the plan feasible to implement?
- If not, what can be done to improve feasibility of the approach?

REVIEW PANEL MEMBERSHIP

The Review Team will include:

Denise Reed
Professor in Department of Earth and Environmental Sciences University of New Orleans

Ernst B. Peebles
Associate Professor
College of Marine Science, University of South Florida

Peter Goodwin
Professor of Civil Engineering, University of Idaho

Hans W. Paerl
Kenan Professor of Marine and Environmental Sciences
UNC-Chapel Hill, Institute of Marine Sciences

Eric B. (Rick) Taylor
Professor, Department of Zoology and Beaty Biodiversity Centre and Museum
University of British Columbia

William V. Sobczak
Associate Professor of Biology and Director of Environmental Studies
College of the Holy Cross